UCH503 INDUSTRIAL POLLUTION ABATEMENT

	L	T	P	Cr
	3	1	2	4.5

Course Objectives:
To understand the important issues and their abatement principles of industrial pollution.

Introduction: Industrial pollution, Different types of wastes generated in an industry, Different water pollutants, Air pollutants and solid wastes from industry, Their effects on living and non-living things, Environmental regulatory legislations and standards, Importance of industrial pollution abatement, Concept of sustainable development, Green house gases, Global warming and climate change, Mass and energy balance with and without reaction.

Water Pollution: Identification, quantification and analysis of wastewater, Classification of different treatment methods into physico-chemical and biochemical techniques, Physico-chemical methods, General concept of primary treatment, Liquid-solid separation, Design of a settling tank, Neutralization and flocculation, Disinfection, Biological methods, Concept of aerobic digestion, Design of activated sludge process, Concept of anaerobic digestion, Biogas plant layout, Different unit operations and unit processes involved in conversion of polluted water to potable standards.

Air Pollution: Classification of air pollutants, Nature and characteristics of gaseous and particulate pollutants, Analysis of different air pollutants, Description of stack monitoring kit and high volume sampler, Atmospheric dispersion of air pollutants, Gaussian model for prediction of concentration of pollutant down wind direction, Plume and its behavior, Operating principles and simple design calculations of particulate control devices, Brief concepts of control of gaseous emissions by absorption, adsorption, chemical transformation and combustion.

Solid Wastes: Analysis and quantification of hazardous and non-hazardous wastes, Treatment and disposal of solid wastes, Land filling, Leachate treatment, Incineration.

Environmental Management System: Environment impact assessment, Its concept and constituents, Environmental audit, ISO-14000 system.

Laboratory work: Characterization of wastewater (pH, BOD, COD, Nitrate, Phosphate, Solids, Turbidity, Alkalinity, Hardness, Dissolved oxygen and fluoride), Ambient air quality measurement by high volume sampler (Particulate, SO_X, NO_X), Gas analysis with Orsat apparatus, Determination of sludge volume index.

Course Learning Outcomes (CLO):

The students will be able to:

1. *quantify and analyze the pollution load.*
2. analyze/design of suitable treatment for wastewater
3. model the atmospheric dispersion of air pollutants.
4. Selection and design of air pollution control devices.
5. analyze the characteristics of solid waste and its handling & management..

Text Books:

1. *Peavy, H.S., Rowe, D.R., and Tchobanoglous, G. Environmental Engineering, McGraw Hill International (1985).*
2. *Metcalf & Eddy, Wastewater Engineering, Tata McGraw-Hill Education Private Limited (2009).*

Reference Books:
1. *Masters, G.M., Introduction to Environmental Engineering and Science, Prentice Hall off India, (2008).*
2. *Rao, C.S., Environmental Pollution Control Engineering, Wiley Eastern (2010).*
3. *De Nevers, N., Air Pollution Control Engineering, McGraw-Hill (2000).*

Evaluation Scheme:

S. No.	Evaluation Elements	Weightage (%)
1	MST	25
2	EST	35
3	Sessional (May includes lab/ tutorials/ assignments/ quiz's etc)	40